

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/042302

International filing date (day/month/year)
16.12.2004

Priority date (day/month/year)
19.12.2003

International Patent Classification (IPC) or both national classification and IPC
C07D239/42, A01N43/54

Applicant
E.I. DUPONT DE NEMOURS AND COMPANY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY****AP3 Rec'd PCT/PTO 05 JUN 2005**
International application No.
PCT/US2004/042302

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/042302

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-14
	No: Claims	1
Inventive step (IS)	Yes: Claims	
	No: Claims	1-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/US2004/042302

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1- Reference is made to the following documents:

- d1: JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, vol. 80, 5 June 1958 (1958-06-05), pages 2829-2832,
- d2: EP-A-0 136 976 (CIBA-GEIGY AG) 10 April 1985 (1985-04-10)
- d3: US-A-4 014 677 (FISCHER ET AL) 29 March 1977 (1977-03-29)

2- Novelty

D1 discloses on page 2832 the preparation of the 4-amino-5-cyano-6-(2-hydroxyethoxy)-2-phenylpyrimidine (see also page 2830, compound XII) which is regarded as encompassed by present formula (I). In this respect, it is observed that the group R defined as "herbicidally effective derivative of COOH" is interpreted as including also hydroxyalkyl moieties since the definition given for R2 in claim 2 includes also the group CH₂OR₁₃ wherein R₁₃ can be H. Hence, in the compound XII of d1, the group -OCH₂CH₂OH corresponds to present group R2, the cyano to R3, the amino to R4 and the phenyl to R1. The general formula (I) of d2 appears to encompass present formula (I) when R3 is NR₆R₇ and R1 is CN or a group XR₅ wherein R₅ is CH₂COA. Present compounds are considered novel vis-à-vis d2 on account of the specific combination of the variables R2 and R4.

Present compounds differ from the compounds of d3 on account of the group R2.

3- Inventive step

3.1- The applicant has set himself the task of providing compounds useful for controlling undesirable vegetation. The experimental data disclosed in the application show that the compounds claimed, indeed possess this activity.

Document d1 relates to pyrimidine derivatives which inhibit the growth of vegetation and can therefore be used as plant growth regulators.

This document is regarded as the closest state of the art.

The technical problem can be seen in the provision of further compounds useful for controlling undesirable vegetation.

3.2- The solution to this problem, represented by present compounds of formula (I), is considered obvious. As indicated above, the formula (I) of d1 generically includes present compounds of formula (I). Many compounds exemplified in d1 are structurally very close to present compounds. For instance, the compounds 14, 29 and 46 differ from present compounds only in that they lack the group R2. However, d1 exemplifies also compounds containing groups corresponding to present group R2, e.g. compounds 525-527. Taking into account of the whole teaching of d1, it appears that the skilled person would deduce that any compound included in the formula (I) would be useful as plant growth regulators.

It appears that the mere fact of selecting novel compounds inside the general formula (I) of d1 and observing that these novel compounds maintain the same properties known for the general formula (I) of d1, it is an activity which does not involve any inventive skill. Accordingly, the requirements of art. 33.3 are not met.